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ABSTRACT

A method and system are provided including an optical head which moves relative to an object at a vision station to scan a projected pattern of imagable electromagnetic radiation across the surface of an object to be inspected at a relatively constant linear rate to generate an imagable electromagnetic radiation signal. In one embodiment, the electromagnetic radiation is light to develop dimensional information associated with the object. The optical head includes at least one projector which projects a grid of lines and an imaging subsystem which includes a trilinear array camera as a detector. The camera and the at least one projector are maintained in fixed relation to each other. Three linear detector elements of the array camera extend in a direction parallel with the grid of lines. The geometry of the optical head is arranged in such a way that each linear detector element picks up a different phase in the grid pattern. As the optical head is scanned across the surface of interest, the detector elements are continuously read out. Depth at each point on the surface is calculated from the intensity reading obtained from each of the detector elements that correspond to the same point on the surface. In this way, the phases of the pattern are calculated from the three intensity readings obtained for each point. In another embodiment, the imagable electromagnetic radiation is polarized and the response of the detector elements is polarization sensitive. The generated images are based on polarization for the surface.

27 Claims, 4 Drawing Sheets

